Discovery of the genus *Kitanola* Matsumura from China, with descriptions of seven new species (Lepidoptera, Limacodidae)

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Abstract: In this paper the genus *Kitanola* Matsumura is recorded for the first time from China with *K. uncula* (Staudinger) and seven new species: *K. spina* sp. nov., *K. spinula* sp. nov., *K. linea* sp. nov., *K. albigrisea* sp. nov., *K. caii* sp. nov., *K. brachygnatha* sp. nov. and *K. eurygnatha* sp. nov. A key to the Chinese species of the genus is provided. The photographs and genital illustrations of the examined species are given. The type specimens of the new species are deposited in Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

Key words: Lepidoptera; Limacodidae; *Kitanola*; new record; new species; China

Genus *Kitanola* was established by Matsumura (1925) in the subfamily Nolinae of Arctiidae based on the type species, *Kitanola sachalinensis* Matsumura. Inoue (1955) transferred it into the Limacodidae; another new species, *Kitanola speciosa* Inoue, was described from Japan in 1956 (Inoue, 1956). Sasaki (1998) restored *Kitanola sachalinensis* Matsumura from the synonym with *K. uncula* (Staudinger 1887) and reported 2 new species from Japan. A total of 5 species are known from Japan, Korea and Russia at present.

In this paper, the genus *Kitanola* Matsumura is recorded for the first time in China with *K. uncula* (Staudinger) and seven more species described as new to science.

The type specimens of the new species are deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

Genus *Kitanola* Matsumura

Kitanola Matsumura, 1925, *J. Coll. Agri. Hokkaido imp. Univ.* 15: 116.

Type species: *Kitanola sachalinensis* Matsumura, 1925.

Microcampa Kawada, 1930, *J. imp. Agric. Exp. Stn. Nishigahara* 1: 256.

Type species: *Heterogena uncula* Staudinger, 1887.

Mediocampa Inoue, 1982, *Moths of Japan* 1: 298; 2: 220.

Type species: *Kitanola speciosa* Inoue, 1956.

Labial palpus upcurved; male antenna filiform. Hind tibia with 2 pairs of spurs. Fore wing with veins R_{3-5} stalked, M_2 and M_3 separate. Hind wing with Rs and M_1 separate.

Male genitalia: uncus typical; gnathos pointed or widening apically; base of costa usually with long processes. Female genitalia: ductus bursae narrow and long, often sclerotized at base, spiraled distally, signum composed of numerous stellate spines if present.

Distribution: East Asia.

Key to species in China (based on male genitalia)

1	Basal process of costa present	2
	Basal process of costa absent	3
2	Basal process of costa not forked apically; aedeagus with a ring of spines at end	***K. spina* sp. nov.**
	Basal process of costa forked apically; aedeagus with a row of minute spines	***K. spinula* sp. nov.**
3	Valva with base wider than apical part	4
	Valva with base almost as wide as apical part	5
4	Sacculus with a broad process bearing spines	***K. linea* sp. nov.**
	Sacculus with a long process not bearing spines	***K. uncula* (Staudinger)**
5	Process of sacculus absent or vague	6
	Process of sacculus present, long	***K. albigrisea* sp. nov.**

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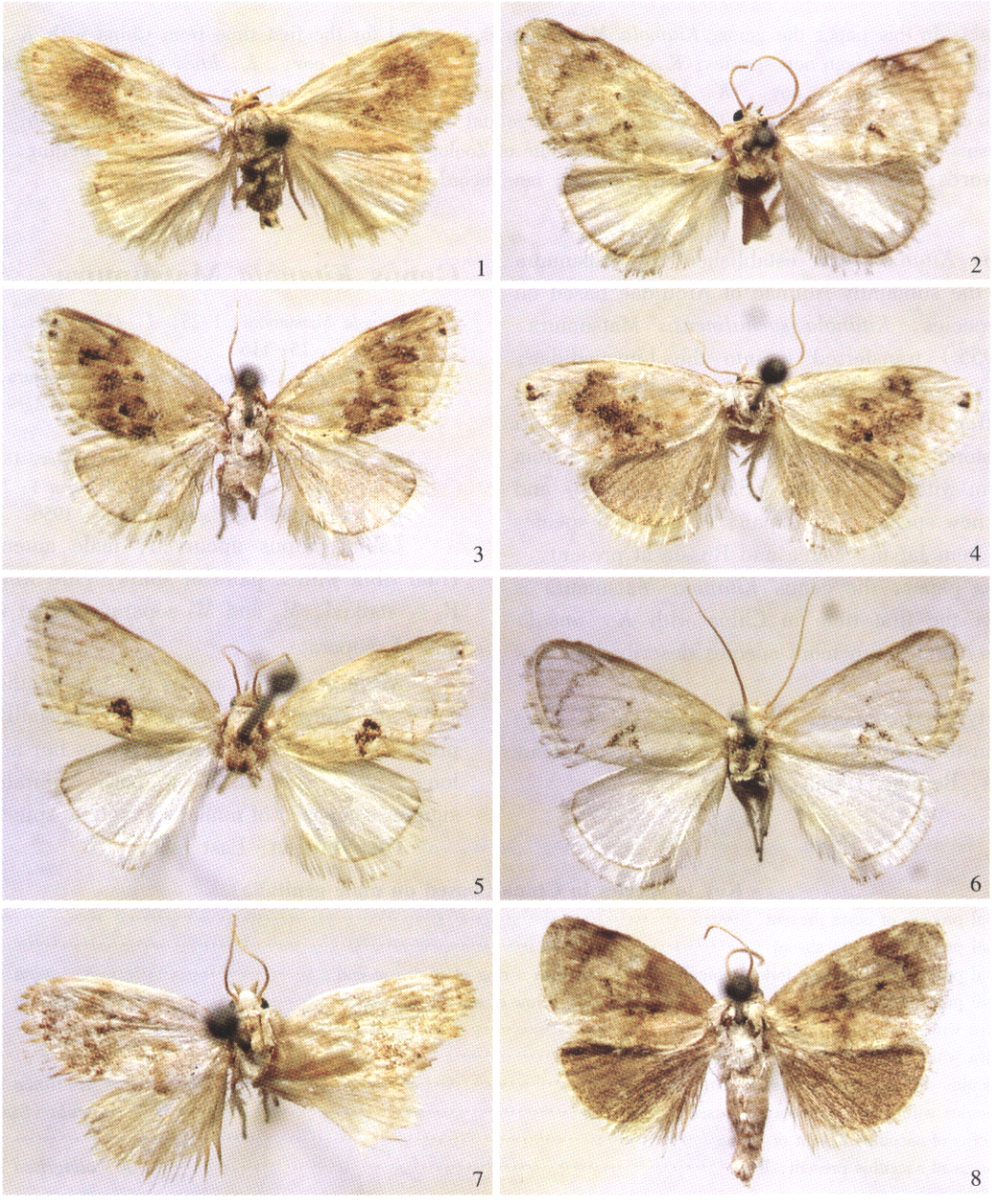
6 Gnathos short and wide ····· 7
Gnathos long and narrow, aedeagus more than two times of valva-length ····· ***K. caii* sp. nov.**
7 Saccus long; aedeagus forked apically ····· ***K. brachygnatha* sp. nov.**
Saccus vague; aedeagus not forked apically ····· ***K. eurygnatha* sp. nov.**

1. *Kitanola uncula* (Staudinger) (Fig. 1)

Heterogena uncula Staudinger, 1887, *Rom. Mem. Lep.* 3: 197, t. 11, f. 9.
Kitanola uncula (Staudinger): Inoue, 1955, *Check list Lepid. Japan* (2): 211.
Microcampa suzukii Matsumura, 1931, *Ins. Matsum.* 5: 108.
Microcampa corana Matsumura, 1931, *Ins. Matsum.* 5: 108.

Specimens examined: Heilongjiang: Dongcun, 3 ♀♀, 30-vii – 1-viii-1979.

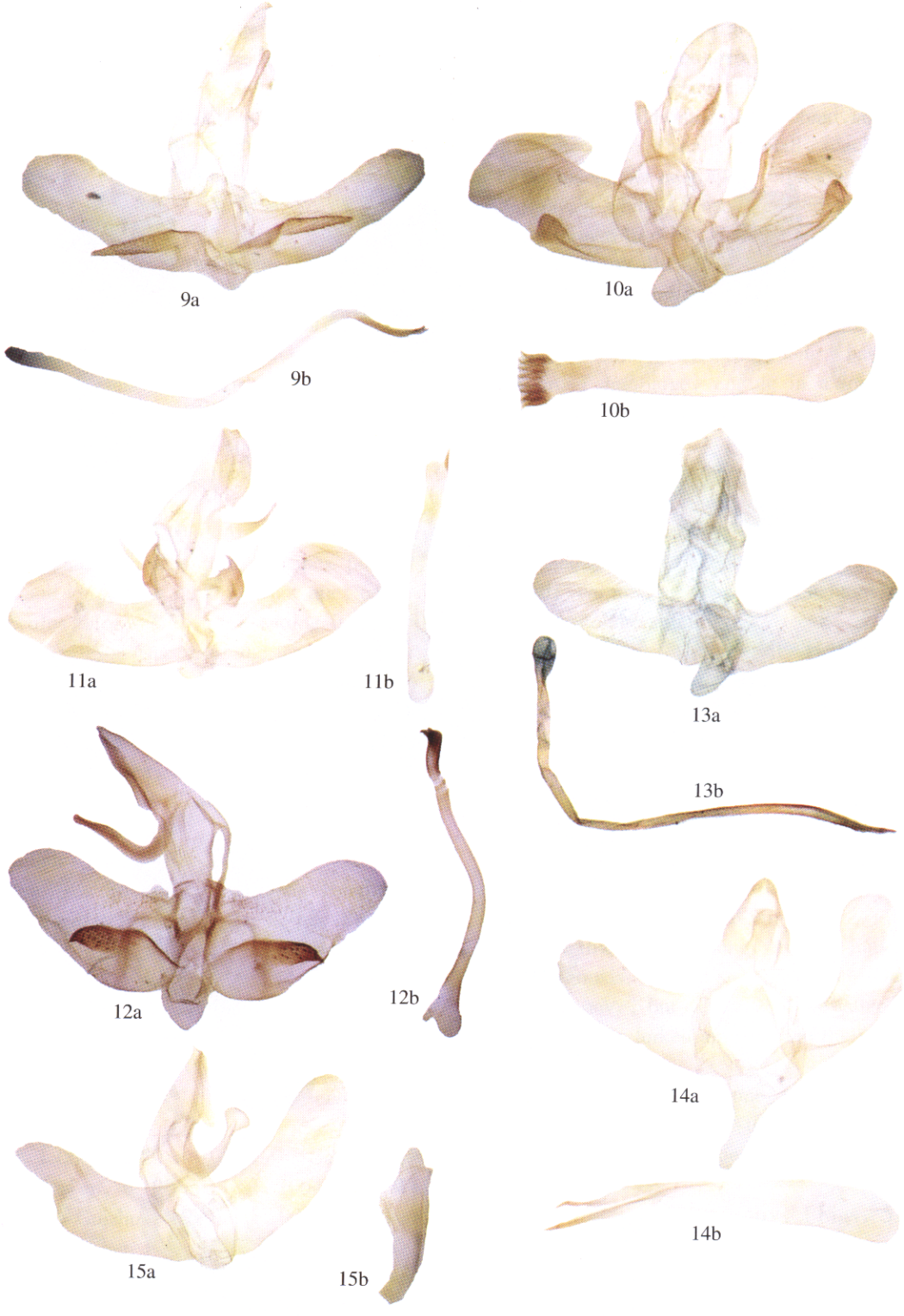
Distribution: Heilongjiang; Japan; Korea; Russia.



Figs. 1 – 8 Adults of *Kitanola* spp.
1. *K. uncula* (Staudinger); 2. *K. albigrisea*, sp. nov.; 3. *K. spina*, sp. nov.; 4. *K. spinula*, sp. nov.; 5. *K. linea*, sp. nov.; 6. *K. sasakii*, sp. nov.; 7. *K. brachygnatha*, sp. nov.; 8. *K. eurygnatha*, sp. nov.

2. *Kitanola albigrisea*, sp. nov. (Figs. 2, 9, 16)

Wing expanse 21 – 24 mm. Body grayish white except for dark yellowish brown at the end of abdomen. Fore wing white, scattered with brown scales; outer fascia ochreous, serrated both margins, defined with



Figs. 9 – 15　Male genitalia of *Kitanola* spp.

9. *K. albigrisea*, sp. nov.; 10. *K. spina*, sp. nov.; 11. *K. spinula*, sp. nov.; 12. *K. linea*, sp. nov.; 13. *K. caii*, sp. nov.; 14. *K. brachygnatha*, sp. nov.; 15. *K. eurygnatha*, sp. nov. a: Male genitalia except aedeagus; b: Aedeagus.

white border; a small discal dot and a larger dark spot below it often present; termen with 2 black dots near apex. Hind wing white; cilia brown.

Male genitalia (Fig. 9): Uncus with a small spine ventrally at end; gnathos narrow and long, apex blunt; valva narrow and long, almost same width from base to end, apex broadly rounded; sacculus with a long process, its lateral margin serrated finely; aedeagus narrow and long, with 1 – 2 stout spines apically.

Female genitalia (Fig. 16): Eighth sternite concave in anterior and posterior margins; base of ductus bursae funnel-shaped, sclerotized slightly, following part sclerotized obviously, distal part long, spiraled; corpus bursae ovate; signum composed of numerous stellate spines.

Holotype ♂: Shaanxi: Ningshan, Huoditang 1 620 m, 1 ♂, 27-vii-1979, leg. Han Yinheng. **Paratypes:** 1 ♀, locality and collector same as holotype, 7-viii-1979; 1 ♂, locality same as holotype,

Figs. 16 – 20 Female genitalia of *Kitanola* spp.
16. *K. albigrisea*, sp. nov.; 17. *K. spina*, sp. nov.; 18. *K. spinula*, sp. nov.; 19. *K. linea*, sp. nov.; 20. *K. caii*, sp. nov.

26-vii-1998, leg. Yao Jian. 1 ♀, Gansu: Wenxian, Qiujiaba 2 350 m, 21-vii-1999, leg. Zhu Chaodong; 1 ♂, Gansu: Zhouqu, Shatanglinchang 2 400 m, 14-vii-1999, leg. Yao Jian. 1 ♂, Henan: Songxian, Mt. Baiyun 1 510 m, 14-viii-2004, leg. Wu Chunsheng.

Distribution: Henan, Shaanxi, Gansu.

Diagnosis: This new species is related to *K. uncula* (Staudinger), but differs from the latter by the longer valva with longer process of sacculus.

Etymology: The name is derived from Latin "*albus*" (= white) and "*griseus*" (= gray), referring to the whitish gray forewing.

3. *Kitanola spina*, sp. nov. (Figs. 3, 10, 17)

Wing expanse 18 – 22 mm. Body grayish white except for blackish brown in apical half of abdomen. Fore wing yellowish white, densely scattered with brown scales; median fascia blackish brown, broad, embedded with netty white lines; discal dot small, black; termen with a larger black spot near apex. Hind wing grayish white, densely scattered with tiny brown scales; cilia grayish brown.

Male genitalia (Fig. 10): Apical spine of uncus very small; gnathos narrow and long, apex pointed; valva narrow and long, base more narrow, apex pointed slightly; sacculus narrow and long, ending in a short spine; basal process of costa broad and large, ending in a long spine each side; aedeagus narrow and long, end with a ring composed of spines.

Female genitalia (Fig. 17): Eighth sternite sclerotized in anterior area; basal part of ductus bursae funnel-shaped, sclerotized slightly, distal part long, spiraled; corpus bursae ovate; signum composed of numerous stellate spines.

Holotype ♂: Shaanxi: Ningshan, Huoditang, 1 620 m, 27-vii-1979, leg. Han Yinheng. **Paratypes**: 1♀8 ♂♂, locality and collector same as holotype, 27-vii – 5-viii-1979; 2 ♂♂, Hubei: Shengnongjia 1 800 m, 1-viii-1981, leg. Han Yinheng, 1♀, 24-vii-1980, 1 ♂, 28-v-1985; 1 ♂, Sichuan: Mt. Emei, 800 – 1 000 m, 25-vi-1957, leg. Zhu Fuxing, 1♀, 15-ix-1957, leg. Lu Youcai, 1 ♂, 20-vi-1979, leg. Shang Jingwen; 1 ♂, Sichuan: Dujiangyuan, 1 000 m, 20-v-1979, leg. Gao Ping; 1 ♂, Sichuan: Ya'an, 1 100 m, 17-vi-2004, leg. Wei Zhongmin; 1 ♂, Guizhou: Daozheng, 900 – 1 400 m, 18-viii-2004, leg. Chen Fuqiang.

Distribution: Hubei, Sichuan, Guizhou, Shaanxi.

Diagnosis: This new species is related to *K. uncula* (Staudinger), but differs from the latter by the valva with a basal process of costa.

Etymology: The name is derived from Latin "*spina*" (= spine), referring to the larger spines in the male genitalia.

4. *Kitanola spinula*, sp. nov. (Figs. 4, 11, 18)

Wing expanse 16 – 20 mm. Body grayish white except for dark brown in apical half of abdomen. Fore wing yellowish brown, scattered with brown scales; median fascia yellowish brown, broad, embedded with netty white lines; discal dot small, black; termen with a larger black spot near apex; cilia grayish white. Hind wing grayish white, densely scattered with tiny brown scales; termen brown; cilia grayish white.

Male genitalia (Fig. 11): Apical spine of uncus very small; gnathos narrow and long, apex pointed; valva narrow and long, base more narrow, apex pointed slightly; sacculus narrow and long; basal process of costa broad and large, ending in a long and a short spines each side; aedeagus narrow and long, end with a row of minute spines.

Female genitalia (Fig. 18): Eighth sternite with a membranous process at each lateral anterior margin, sclerotized around ostium; basal part of ductus bursae funnel-shaped, sclerotized slightly, distal part long, spiraled; corpus bursae ovate; signum composed of numerous stellate spines.

Holotype ♂: Hunan: Mt. Hengshan, 24-viii – 5-ix-1979, leg. Zhang Baolin. Paratypes: 5 ♂♂, data same as holotype; 1♀, Zhejiang: Mt. Mogan, 30-vi-1980, leg. Chen Qihu; 1♀, Zhejiang: Mt. Tianmu, 28-vii-1972; Zhejiang: Hangzhou, 1 ♂, 7-viii-1980, 1 ♂, 20-vii-1972, 1 ♂, 26-vii-1973, leg. Zhang Baolin; 1 ♂, Anhui: Mt. Jiuhua, 24-vii-1979, leg. Wang Sizheng; 1 ♂1♀, Jiangxi: Mt. Lushan, 28-vii-1975, leg. Liu Youqiao, 1 ♂, 3-vii-1975, leg. Xu Jianhua, 1 ♂, 30-viii-1982.

Distribution: Zhejiang, Anhui, Jiangxi, Hunan.

Diagnosis: This new species is related to *K. spina* sp. nov., but differs from the latter by the basal process of costa forked apically and the aedeagus with a row of minute spines.

Etymology: The name is derived from Latin "*spina*" (= spine) and "*-ulus*" (= small), referring to the smaller spines in the male genitalia.

5. *Kitanola linea*, sp. nov. (Figs. 5, 12, 19)

Wing expanse 16 – 19 mm. Body grayish white except for dark yellowish brown at end of abdomen. Fore wing white, scattered with ochreous scales; outer fascia ochreous, narrown, arched outwardly; a small discal dot and a larger dark spot below it present; termen with a black dot near apex. Hind wing white; cilia brown.

Male genitalia (Fig. 12): Uncus with a small spine ventrally at end; gnathos long, apex blunt; basal half of valva wide, apical half tapering to a rounded apex; sacculus with a long process at base, its apical lateral margin serrated finely; aedeagus narrow and long, with 1 stout spine apically.

Female genitalia (Fig. 19): Eighth sternite broad; ductus bursae wider and strongly sclerotized at base, apical part narrow and long, spiraled; corpus bursae ovate; signum composed of numerous stellate spines.

Holotype ♂: Guangxi: Longsheng, 900 m, 11-vi-1963, leg. Wang Chunguang. **Paratype**: 1 ♀, Hubei: Shengnongjia, 18-vii-1980.

Distribution: Hubei, Guangxi.

Diagnosis: This new species is related to *K. uncula* (Staudinger), but differs from the latter by the process of sacculus bearing spines.

Etymology: The name is derived from Latin "*linea*" (= line).

6. *Kitanola caii*, sp. nov. (Figs. 6, 13, 20)

Wing expanse 18 – 20 mm. Body grayish white except for dark yellowish brown at end of abdomen. Fore wing white to yellowish white, scattered with brown scales; pattern variable: median fascia wide, sometimes reduced into a spot near to inner margin; ochreous outer fascia present or absent; a small discal dot often present; termen with 0 – 2 black dots near apex. Hind wing white to light brown; cilia brown.

Male genitalia (Fig. 13): Uncus with a small spine ventrally at end; gnathos narrow and long, apex pointed; valva narrow and long, almost same width from base to end, apex broadly rounded; aedeagus narrow and long, with 1 – 2 stout spines apically.

Female genitalia (Fig. 20): Eighth sternite concave in anterior and posterior margins; base of ductus bursae wide, sclerotized slightly, distal part long, spiraled; corpus bursae ovate; signum composed of numerous stellate spines.

Holotype ♂: Gansu: Zhouqu, Shatanglinchang, 2 350 m, 14-vii-1998, leg. Zhang Xuezhong. Paratypes: 1 ♂, Henan: Mt. Funiu, 7 – 9-viii-1993, leg. Wang Zhiguo; 1 ♀, Henan: Luanchua, Longyuwang, 100 m, 19-vii-2004, leg. Wu Chunsheng; 1 ♂, Anhui: Mt. Huangshan, 15-v-1978, leg. Wang Sizheng.

Distribution: Anhui, Henan, Gansu; Japan.

Diagnosis: This new species is related to *Kitanola masayukii* Sasaki, but differs from the latter by the whitish forewing and a thick mass of granules on anellus absent, aedeagus straightish (in *K. masayukii* slightly spiral) in the male genitalia.

Etymology: The specific name is named after Mr. Cai Rongquan, who made significant contribution in studying Chinese Limacodidae.

7. *Kitanola brachygnatha*, sp. nov. (Figs. 7, 14)

Wing expanse about 15 mm in male. Body pale yellowish white. Antenna ochreous. Fore wing white, scattered with ochreous scales; inner and outer fasciae ochreous brown; distal dot black; termen with a black dot each vein; cilia longer, pale yellow. Hind wing grayish white.

Male genitalia (Fig. 14): Tegumen short and wide relatively, bearing long hair along lateral margin; uncus with a small spine ventrally at end; gnathos short and wide, apex rounded; valva narrow and long, apex broadly rounded; juxta sclerotized moderately; saccus narrow and long; aedeagus stout and long, apical half forked, with a pointed apex.

Holotype ♂: Yunnan: Xishuangbanna, 650 m, 22-v-1962, leg. Song Shimei.

Distribution: Yunnan.

Diagnosis: The new species is similar to *K. speciosa* Inoue, but differs from the latter by the sacculus without process and the aedeagus forked apically in male genitalia.

Etymology: The name is derived from Greek "*brachys*" (= short) and "*gnathos*", referring to the short gnathos in the male genitalia.

8. *Kitanola eurygnatha*, sp. nov. (Figs. 8, 15)

Wing expanse 15 – 18 mm in male. Body pale chreous yellow. Antenna ochreous yellow. Fore wing white, densely scattered with ochreous scales; inner fascia ochreous brown, wider at middle; outer fascia ochreous brown, from apical 1/3 of costal margin to tornus; distal dot black; termen with a blackish brown dot each vein; cilia longer, pale yellow. Hind wing grayish ochreous.

Male genitalia (Fig. 15): Tegumen narrow and long, bearing long hair along lateral margin; uncus with a small spine ventrally at end; gnathos long, apex widening; valva narrow and long, apex broadly rounded; juxta sclerotized moderately; saccus very short; aedeagus stout, shorter than valva-length, cornuti absent.

Holotype ♂: Guangdong: Guangzhou, 11-viii-1981, leg. Dong Zulin. **Paratypes**: 2 ♂♂, Hunan: Mt. Hengshan, 1-vi-1974, leg. Zhang Baolin; 1 ♂, Zhejiang: Hangzhou, vi-1981.

Distribution: Zhejiang, Hunan, Guangdong.

Diagnosis: This new species is related to *K.*

brachygnatha, sp. nov., but differs from the latter by the very short saccus and shorter aedeagus not forked apically in male genitalia.

Etymology: The name is derived from Greek "*eurys*" (= wide) and "*gnathos*", referring to the apically widening gnathos in the male genitalia.

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铃刺蛾属在中国的首次发现及七新种记述 (鳞翅目: 刺蛾科)

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摘要: 首次报道铃刺蛾属 *Kitanola Matsumura* 及环铃刺蛾 *K. uncula* (Staudinger)在中国有分布, 并记述 7 新种, 即针铃刺蛾 *K. spina* sp. nov., 小针铃刺蛾 *K. spinula* sp. nov., 线铃刺蛾 *K. linea* sp. nov., 灰白铃刺蛾 *K. albigrisea* sp. nov., 蔡氏铃刺蛾 *K. caii* sp. nov., 短颚铃刺蛾 *K. brachygnatha* sp. nov. 和宽颚铃刺蛾 *K. eurygnatha* sp. nov.。编制了本属中国已知种的检索表, 提供了成虫彩色照片和外生殖器特征图。新种模式标本均保存在中国科学院动物研究所。

关键词: 鳞翅目; 刺蛾科; 铃刺蛾属; 新记录; 新种; 中国

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